

Digital HeNe Single-Point Laser Doppler Vibrometer Vector-Series



OptoMET Laser Doppler Vibrometers (LDV) are very fast and easy-to-operate vibration measuring instruments. They are used for precise, non-contact, and non-reactive measurements of mechanical and acoustic parameters such as vibration displacement, velocity and acceleration.

Thanks to our innovative digital signal processing technology and the highest optical sensitivity, our instruments provide quick and simple vibration measurements of even the most challenging systems, including high vibration frequencies, large working distances, small vibration amplitudes, high linearity, and high accelerations or velocity.

COST EFFICIENT AND MODULAR

The Vector-series are the universal vibrometers which cover a large number of vibration measurement applications. They are specially suitable for measurements on reflective surfaces or through water, as well as in applications where the smallest possible size of the laser spot is important.

The vibrometer has a modular design and can be individually matched to any measuring task with different objectives and decoders.

Ideal for:

- Reflective surfaces
- Small objects
- Measurement through water or glass, etc.

Technical Data

Measured Quantities – Performance Parameters

Max.	Max. ²	Best Vel. ¹	Max. ^{2,3}	Best Disp. ¹	Max. ^{2,3}	Accel. ¹
Frequency	Velocity	Resolution	Displacement	Resolution	Acceleration	Resolution
10 MHz	10 m/s	1.3 nm s ⁻¹ /√Hz	± 50 mm	0.05 pm /√Hz	32 Mg	1.8μg /√Hz

Measurement Specifications

Measured quantities	Velocity, displacement, acceleration
Frequency bandwidth ²	0 Hz - 10 MHz
Max. velocity ²	10 m/s
Velocity measurement ranges ²	14
Signal processing	Digital (FPGA based)
Source impedance	50 Ohm
Analog signal output	3×BNC, ± 2 V: - Velocity, displacement ³ , acceleration ³ - Data rate: 160 MSamples/s @ 16-bit
Digital Signal Output & PC-Interface	1 Gbit RJ45 Ethernet: - Data rate: 1 GBit (53.3 MSamples/s @ 16-bit) - Digital data acquisition- and analysis software <i>OptoGUI</i> - Digital remote control of device settings
External Trigger	Digital external trigger in/out via SMB
Filter	High-pass filter: off / 25 Hz / 20 kHz Low-pass filter: off / 2.5 / 5 / 10 / 20 / 50 / 100 / 200 kHz Tracking filter: off / slow / fast

General Device Specifications

User interface output	Color screen 3.5" + 20 segment LED bargraph
User interface input	Touch screen, knobs with push-button, key switch (power)
Operating temperature	+5 to 40°C
Dimensions	Length × width × height (excluding handle and lens): 380 × 180 × 148 mm
Weight	8 kg + objective lens
Power supply	110 -240 V AC (50-60Hz) or 12 V DC
Portable Operation	Possible
Portable power supply	12 V DC portable charger or commercially available power bank ³

¹ The resolution is defined as the signal amplitude (rms) that produces 0 dB signal/noise ratio with 1 Hz spectral resolution at 50 % fmax

² Actual specifications depend on the configured decoder.

³ Optional available

⁴ For Remote Sense decoder

Optical Specifications

Working distances	Variable working distance from 5 mm to >100 m
Laser wavelength	632.8 nm, visible, red laser beam
Laser safety class	Output power: <1 mW, class 2, eye safe
Optics	Auto-, remote-, and manual focusing

Decoders^{5,6}

⁵For details see decoder data-sheets. ⁶Variations from displayed decoders available on request.

Velocity Decoder

Decoder	Description	Measuring Ranges ⁵	Max. Velocity	Typical Resolution ¹	Range Frequency
D-VD-1	Basis	8	2 m/s	6 nm s ⁻¹ /√Hz	0 Hz – 500 kHz
D-VD-2	Sense	11	2 m/s	1.3 nm s ⁻¹ /√Hz	0 Hz – 1 MHz
D-VD-3	High Speed	11	10 m/s	6 nm s ⁻¹ /√Hz	0 Hz – 2.5 MHz
D-VD-4	High Frequency	9	5 m/s	6 nm s ⁻¹ /√Hz	0 Hz – 10 MHz
D-VD-5	Master	14	10 m/s	1.3 nm s ⁻¹ /√Hz	0 Hz – 10 MHz

Displacement Decoder

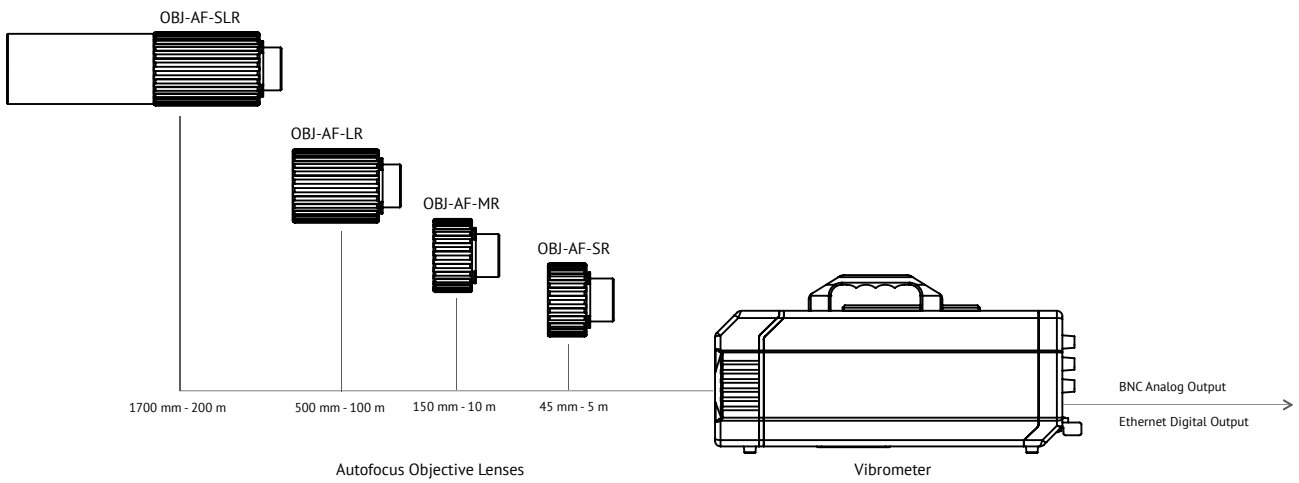
Decoder	Description	Measuring Ranges ^{5,7}	Max. Displacement	Typical Resolution ¹	Range Frequency
D-DD-1	Basis	19	± 50 mm	0.05 pm/√Hz	0 Hz – 500 kHz
D-DD-2	Sense	19	± 50 mm	0.05 pm/√Hz	0 Hz – 1 MHz
D-DD-3	High Speed	19	± 50 mm	0.05 pm/√Hz	0 Hz – 2.5 MHz
D-DD-4	High Frequency	19	± 50 mm	0.05 pm/√Hz	0 Hz – 10 MHz
D-DD-5	Master	19	± 50 mm	0.05 pm/√Hz	0 Hz – 10 MHz

Acceleration Decoder

Decoder	Description	Measuring Ranges ^{5,7}	Max. Acceleration	Typical Resolution ¹	Range Frequency
D-AD-1	Basis	8	0.64 Mg	70 μg /√Hz	0 Hz – 500 kHz
D-AD-2	Sense	11	1.28 Mg	1.8 μg /√Hz	0 Hz – 1 MHz
D-AD-3	High Speed	11	16 Mg	70 μg /√Hz	0 Hz – 2.5 MHz
D-AD-4	High Frequency	9	32 Mg	70 μg /√Hz	0 Hz – 10 MHz
D-AD-5	Master	14	32 Mg	1.8 μg /√Hz	0 Hz – 10 MHz

⁷ Measurement range limited by used velocity decoder.

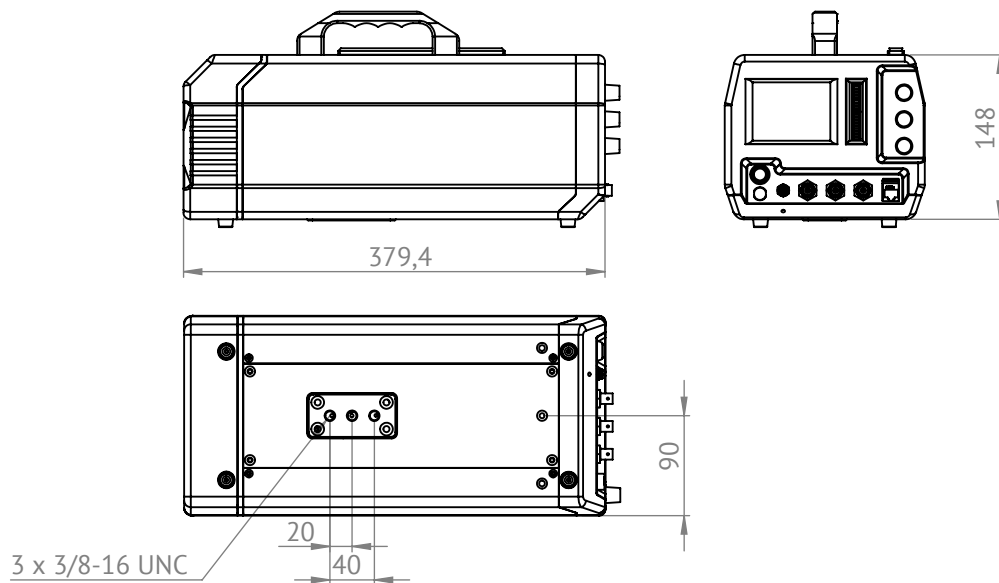
Set-up



Objective lens






Specification	Short-Range Autofocus	Mid-Range Autofocus	Long-Range Autofocus	Super-Long Range Autofocus
Focal length (mm)	25	50	100	200
Min. stand-off distance (mm)	45	150	500	1700
Min. Spot size in μm	20	25	53	69
Working distance	45 mm ... 5 m	150 mm ... 10 m	500 mm ... 100 m	1.7 m ... 200 m

Dimension of the Vibrometer




Accessories

^S Standard included, ^O Optional available

	Transport Case for Single Point Vibrometer Stable and waterproof <i>Peli</i> case for safe keeping and transport of vibrometer. External dimension (L x B x H): 61.9 x 49.2 x 22.3 cm	S
	Transport Bag Compact und light transport bag for outdoor measurements or transport as carry-on baggage in an plane.	O
	Telescope For measurements from a greater distance, a telescope makes it easier to find the measuring point. The telescope can be easily mounted on the gauge rail at the top of the vibrometer.	O
	Mobile Battery Portable battery charger, external battery power bank. For powering the vibrometer when performing outdoor measurements.	O
	Tripod with Fluid Head Precisely align your vibrometer with high quality tripods by <i>Manfrotto</i> .	O

Software

	OptoGUI Analysis Software Software for data acquisition, analysis and remote control. Live animation of measured time and frequency data.	O
---	---	---

OptoGUI software includes

Remote control	Remotely control all vibrometer settings via ethernet	S
Read-out	Read out data via ethernet with up to 80 MS/s	S
Time data	Live animation of measured vel./disp./accel. data	S
Export data	Export time data as .csv, .h5, or .mat files	S
Fourier-Trafo	Perform the Fast-Fourier-Transformation of the data while measuring	S
Frequency spectrum	Display the measured data in the frequency-domain (spectrum)	S
FFT Lines	FFT can be calculated with up to 8 Mio. FFT lines	S
Peak identification	Automatically identify signal peaks in the frequency spectrum	S
Fourier boundaries	Limit live FFT-calculation to certain time ranges of the time data	S
Signal trigger	Trigger your measurement with the vel., disp., or accel. signal	S
Multiple traces	Record and recall multiple traces of the vel./disp./accel. time data	S

Maintenance Specials

Warranty

Warranty	12 month warranty for all not self-inflicted defects	S
Warranty extension	Extension of standard warranty to 24 months	0

Software Updates

Software maintenance	Free software updates within warranty period	S
Extended maintenance	Additional extension of software updates by 12+ months	0

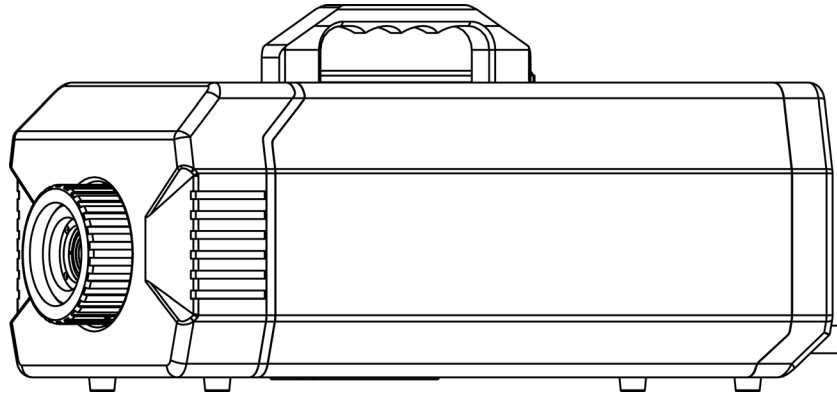
Hardware Maintenance

Hardware Maintenance	Free hardware maintenance within warranty period	S
Extended maintenance	Additional extension of hardware maintenance by 12+ months	0
Recalibration & cleaning	Cleaning & realignment of optical parts, check of laser output power, check integrity of fiber, redo factory calibration	0

Laser product label

DO NOT STARE INTO BEAM Class 2 Laser Product
Laser CLASS 2: visible, red laser beam, $\lambda=632.8$ nm,
output power: ≤ 1 mW





HeNe Single-Point Vibrometer



CONTACT US

optomet GmbH
Pfungstaedter Strasse 92
64297 Darmstadt
Germany
Phone +49 6151 4920-884
sales@optomet.de
www.optomet.com